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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/559,534

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Takao Yashiro

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23117

7590

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EXAMINER

HAMILTON, CYNTHIA

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/559,534	<b>Applicant(s)</b> YASHIRO ET AL.	
	<b>Examiner</b> Cynthia Hamilton	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12/02/2005, 0/13/06.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/02/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1—18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15-18 recite the limitation "the liquid photocurable resin" in lines 1 and/or

2. There is insufficient antecedent basis for this limitation in claim 1 upon which these claims depend. Claim 1 has no liquid limitations whatsoever.

4. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 1 requires the presence of "(A) a component comprising a carboxyl group that may dissociate in the presence of an acid".

- b. Applicants use "may" with respect to dissociation in the presence of an acid. Is "may" used to reference an optional property of component (A) or is "may" being used to "oblige" the component (A) to have this property? The examiner believes applicants intend "may" to be a requirement of component (A), but there are multiple meanings to "may" as shown by Answers.com, Brainy Quote, and TheFreeDictionary.

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- c. Applicants have required component (A) to comprise a carboxyl group but given no example of such in the entire specification or in any of the dependent claims. A carboxyl group is defined as -COOH in the prior art as evidenced by Merriam-Webster, multiple websites set forth in "define:Carboxyl Group -Google Search" and "The MSDS HyperGlossary: Carboxylic Acid". Applicants disclose in their specification at page 2, lines 18-21, their discovery as "a composition which contains a component comprising a carboxyl group that may dissociate to carbondioxide in the presence of an acid can produce a cured product having superior folding resistance, film impact, and impact resistance." A component is not limited to a single compound and can be any host of compounds or elements or layers or other things. Thus, in using "the component (A) comprised" in claims 2-9 applicants have not required the compounds described in claims 2-9 to have a carboxyl group. What is required is the compounds described in claims 2-9 are part of component (A) and that somewhere in component (A) is a carboxyl group.
- d. Applicants make no requirement in any of the claimed invention that dissociation of the carboxyl group yield carbon dioxide.
- e. Applicants require that component (A) " may dissociation in the presence of an acid". Morrison et al teach at page 602, the disassociation of acid with the addition of acid into water and an ester if an alcohol is present. Thus, carboxyl groups are known generally in the chemical arts to dissassociate in the presence of an acid to form esters and water. Applicants do not require that a specific acid, a specific dissociation, or when and how such dissociation occur in their claimed invention. Thus, all carboxyl groups

disassociate in the presence of acid when conditions are right as evidenced generally by Morrison et al.

f. Applicants appear to be referencing carboxylic acid esters instead of carboxyl groups in their examples of component (A) at pages 3-4 when reference is made to esterification reaction of a polyhydric alcohol and monovalent carboxylic acid to form compound (a) and in showing preferred compounds for (a) on page 7, lines 16-17. No carboxyl group is found in either example given.

g. With respect to claims 3-5, applicants require that component (A) comprise the compounds (a2), (a3) and/or (a4). However there are no ester groups or carboxyl groups explicitly disclosed in any of these compounds. Applicants when referencing these compounds starting at the last line of page 4 going through page 7, is addressing as set forth on page 4, polyhydric alcohols used to make the compound (a) not compounds which are in component (A) but compounds that are used to make the esters of compound (a) which is the compound which is component (A) by preference. Thus, what applicants have claimed with respect to claim 3-5 is only set forth in these claims or is not clearly claimed as reactants used to make the compound of claim 2 and thus confusing with respect to the compositions set forth in the specification submitted. Thus, the intent and thus limits of claims 3-5 are confusing when considering the disclosure as a whole.

For these reasons claims 1-18 are confusing. The examiner believes applicants intended to claim a carboxylic acid ester which disassociates in the presence of an acid, but this is not what applicants claimed when considering the standard meaning of carboxyl group. The examiner

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bases this assumption upon the working examples set forth by applicants and have made rejections in view of this understanding.

5. Claims 3-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. With respect to claims 3-5, applicants require that component (A) comprise the compounds (a2), (a3) and/or (a4). However there are no ester groups or carboxyl groups explicitly disclosed in any of these compounds. Applicants when referencing these compounds starting at the last line of page 4 going through page 7, is addressing as set forth on page 4, polyhydric alcohols used to make the compound (a) not compounds which are in component (A) but compounds that are used to make the esters of compound (a) which is the compound which is component (A) by preference. Thus, what applicants have claimed with respect to claim 3-5 is only supported by the claim language and not by the original specification. Applicants have not shown how the compounds of claims 3-5 are the compound of claim 2 if that is intended. Applicants have not shown any element or composition with any of the compounds of claims 3-5 present which also contain a cationic photoinitiator. Thus, if applicants did not confuse the wording of claims 3-5 as set forth in the proceeding rejection, then the examiner believes there is no enablement for the compositions claimed if applicants intend the compounds of claims 3-5 to be the compound with carboxyl group present.

6. Claims 9 – 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as

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the invention. Claim 9 recites the limitation "the compounds (a) and/or (b)" in last two lines.

There is insufficient antecedent basis for this limitation in the claim or in claim 1 to which claim 9 depends. There is no defining of what (a) and (b) are other than compounds which are monomers. Thus, the limits of claims 9-11 are unclear. The examiner notes that on page 4 there is mention of compound (a), compound (b) and a (co) polymer (c).

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 12-14 and 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Doba (EP 0535 828 A1) as evidenced by Tachiki et al (US 5,230,984). With respect to instant claims 1, 12-14 and 16 and 18, Example 9 of Doba anticipates the instant composition and fabricated product wherein Monomer II is isobornyl acrylate which is an carboxylate ester which is acid degradable, i.e. dissociates in acid, as evidenced by Tachiki et al in col. 3, line 44 to col. 4, line 18, and reads on instant (A) if carboxylate ester is meant as a compound containing a carboxyl group by applicants. Monomer I is a diacrylate of ethylene oxide modified bisphenol A and a species of instant (E). Monomer III is 3,4 epoxycyclohexylmethyl 3,4-epoxycyclohexane carboxylate and a species of instant cationically polymerizable compound. Initiator I is a free radical initiator and reads on instant (F) . Initiator II is a cationic photoinitiator and reads on instant (C). In Doba, see particularly Examples 1, 5 and 9 and Table I and claims 1-3. The species set forth by Doba anticipates the genus applicants invention set forth in claims 1, 12-14 and 16 and 18. "A generic claim cannot be allowed to an applicant if the

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prior art discloses a species falling within the claimed genus.” *In re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989).

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doba (EP 0535 828 A1) as evidenced by Tachiki et al (US 5,230,984) as applied to claim 1 above, and further in view of Johnson et al (WO 03/089991 A2) and Fan et al (US 5,002,854). The addition of the reactive particles of Johnson et al to the compositions of Doba would have been obvious to obtain a stable composition and act as a filler. Johnson et al does not disclose the size of the particles made but references Fan et al on page 1. Fan et al in col. 13 teach the particle size as 0.097 micron. Thus, the particles of Johnson et al would be in the general range as that replaced such as the particles of Fan et al. Because of this, the range of particle size expected to be formed by Johnson et al in view of Fan et al would have been at least overlapping with that of the instant invention thus, making the composition of claim 15 *prima facie* obvious.

10. Claims 1, 9-14 and 16- 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Noguchi et al (5,476,752) as evidenced by Tachiki et al (US 5,230,984) and Matsubara et al (3,936,342). With respect to claims 1, 9-14 and 18, Example 1 of Noguchi et al anticipates the instant compositions and photofabricated product. With respect to claims 1, 9-14 and 16- 18, Example 4 of Noguchi et al anticipates the instant compositions and photofabricated product. LP-1 is a copolymer made from methyl methacrylate and t-butyl methacrylate and dimethylaminoethyl methacrylate having an weight average molecular weight of 78,000. This is a copolymer made from at least two different monomers, i.e. instant (a) and (b), and polymerized t-butyl methacrylate is which is an carboxylate ester which is acid degradable, i.e. dissociates in



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acid, as evidenced by Tachiki et al in col. 3, line 44 to col. 4, line 18. With respect to instant claims 16-17, Epikote 1001 is a polyether polyol as evidenced by Matsubara et al In col. 3, lines 3-36 with at least two hydroxy groups present on average to obtain the required epoxy equivalency given. The species set forth by Noguchi et al anticipate the genus applicants invention set forth in claims 1, 9-14 and 16-18. "A generic claim cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus." *In re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989). The examiner makes note that Noguchi et al (5,476,752) is an English equivalent of DE 36 21 477 A cited by applicants.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al (5,476,752) as evidenced by Tachiki et al (US 5,230,984) and Matsubara et al (3,936,342) as applied to claim 1 above, and further in view of Johnson et al (WO 03/089991 A2) and Fan et al (US 5,002,854). The addition of the reactive particles of Johnson et al to the compositions of Noguchi et al would have been obvious to obtain a stable composition and act as a filler. Johnson et al does not disclose the size of the particles made but references Fan et al on page 1. Fan et al in col. 13 teach the particle size as 0.097 micron. Thus, the particles of Johnson et al would be in the general range as that replaced such as the particles of Fan et al. Because of this, the range of particle size expected to be formed by Johnson et al in view of Fan et al would have been at least overlapping with that of the instant invention thus, making the composition of claim 15 prima facie obvious.

12. Claims 1 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Sumino et al (EP 0 887 706 A1). The examiner has fully considered Sumino et al but finds no evidence

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the polymer is acid cleavable as it is not a tertiary carbon attached to the acid portion of the carboxylic acid ester. However, because EP 0 887 706 A1 presents a carboxyl group in the +polymer of Example 3, the composition of Sumino et al is held to anticipate the instant compositions of claims 1 and 12-14 with the understanding that all carboxylic acid groups are inherently dissociable in the right added acid or water from  $\text{-COOH}$  to  $\text{COO}^-$  anion.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ogino et al (Chem. Mater. 1998) teach the use of diacrylate and dimethacrylate monomers containing thermally cleavable tertiary ester linkages which after polymerization, cleave thermally and are completely soluble in dilute sodium hydroxy and ammonium hydroxide solution. Ogino et al teach that this degradation could be useful for stereolithographic materials to allow rework by degradation and removal of polymerized materials. No showing of hybrid systems is made as in adding cationic cure to the free radical cured systems generated by Ogino et al. Referenced in the second column on page 3836 of Ogino et al is the noticed auto acceleration of the degradation when resulting carboxyl groups are generated at cleavage of poly (tert-butyl acrylate). Ober et al (US 6,355,702) also addressed this decomposition of the polymerized diacrylates. These acrylates are species of applicants component (A) as disclosed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Hamilton/  
Primary Examiner, Art Unit 1795

March 17, 2008